

In the Specification:

On page 1, after the title insert the following:

RELATED APPLICATIONS

This is a U.S. national stage of application No. PCT/DE2003/003222, filed on 26 September 2003.

FIELD OF THE INVENTION

On page 1, amend the paragraph beginning on line 5 as follows:

The present invention relates to ~~radiation-emitting thin film semiconductor chips according to the preamble of patent claim 1 or according to the preamble of patent claim 19 or 34, respectively~~ a radiation-emitting thin-film semiconductor chip with an epitaxial multilayer structure, which contains an active, radiation-generating layer and has a first main face and a second main face, remote from the first main face, for coupling out the radiation generated in the active, radiation-generating layer.

On page 1, before line 10, insert the following heading:

BACKGROUND OF THE INVENTION

On page 5, before line 4, insert the following heading:

SUMMARY OF THE INVENTION

On page 5, amend the paragraph beginning on line 4 as follows:

~~The present invention is based on the object of providing~~ One object of the present invention is to provide a radiation-emitting thin-film semiconductor chip, in particular based on GaN, which has an improved external efficiency of coupling out radiation.

On page 5, delete the paragraph beginning on line 9 through line 14 in its entirety.

On page 5, amend the paragraph beginning on line 16, as follows:

~~The~~ This and other objects are attained in accordance with one aspect of the present invention directed to a radiation-emitting thin-film semiconductor chip ~~according to the invention has~~ with a multilayer structure, which contains an active, radiation-generating layer and has a first main face and a second main face - remote from the first main face - for coupling out the radiation generated in the active, radiation-generating layer. ~~In the case of the invention, the multilayer structure preferably contains a GaN based material. For the multilayer structure it is also possible, however, to use other compound semiconductors from the III-V semiconductor material system, such as phosphide or arsenide compound semiconductors (that is to say $\text{Al}_a\text{Ga}_b\text{In}_{1-a-b}\text{P}$ or $\text{Al}_a\text{Ga}_b\text{In}_{1-a-b}\text{As}$, where $0 \leq a \leq 1$, $0 \leq b \leq 1$ and $a+b \leq 1$), or from the II-VI semiconductor material system. Furthermore, the~~ The first main face of the multilayer structure is coupled to a reflective layer or interface, and the region of the multilayer structure that adjoins the second main face of the multilayer structure is patterned one- or two-dimensionally.

On page 5, before line 37, insert the following:

The multilayer structure preferably contains a GaN-based material. For the multilayer structure it is also possible, however, to use other compound semiconductors from the III-V semiconductor material system, such as phosphide or arsenide compound semiconductors (that is to say $\text{Al}_a\text{Ga}_b\text{In}_{1-a-b}\text{P}$ or $\text{Al}_a\text{Ga}_b\text{In}_{1-a-b}\text{As}$, where $0 \leq a \leq 1$, $0 \leq b \leq 1$ and $a+b \leq 1$), or from the II-VI semiconductor material system.

On page 7, delete the paragraph beginning on line 17 through line 21 in its entirety.

On page 7, amend the paragraph beginning on line 23 as follows:

~~This~~ Another aspect of the present invention is directed to a radiation-emitting thin-film semiconductor chip according to the invention likewise has a multilayer structure, which contains an active, radiation-generating layer and has a first main face and a second main face - remote from the first main face - for coupling out the radiation generated in the active, radiation-generating layer. The first main face of the multilayer structure is once again coupled to a reflective layer or interface. In contrast to the semiconductor chip described above, here a transparent layer is provided between the first main face of the multilayer structure and the reflective layer or interface, said transparent layer being patterned one- or two-dimensionally.

On page 9, delete the paragraph beginning on line 4 through line 8 in its entirety and insert the following:

Another aspect of the invention is directed to a radiation-emitting thin-film semiconductor chip with an epitaxial multilayer structure, which contains an active, radiation-generating layer and has a first main face and a second main face, remote from the first main face, for coupling out the radiation generated in the active, radiation-generating layer, wherein the first main face of the multilayer structure is coupled to a reflective layer or interface, and a one- or two-dimensionally patterned coating layer is arranged on the second main face of the multilayer structure.

On page 9, before line 10, insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 9, after line 11, insert the following:

Figure 9A shows a plan view of a semiconductor chip with one-dimensional patterning.

Figure 9B shows a plan view of a semiconductor chip with two-dimensional patterning.

On page 10, before line 13, insert the following heading:

DETAILED DESCRIPTION OF THE DRAWINGS

On page 11, amend the paragraph beginning on line 29 through page 12, line 4 as follows:

The patterning of the multilayer structure 12 may be formed to extend either in one direction ~~one-dimensionally~~, that is to say with depressions 24 running in only one coordinate direction of the plane of the second main face 18, such patterning being referred to as one-dimensional patterning, or in two directions, ~~or two-dimensionally~~, that is to say with depressions 24 running in two coordinate directions, ~~[[-]]~~ preferably ~~running~~ perpendicular to one another, ~~[[-]]~~ of the plane of the second main face 18 such patterning being referred to as two-dimensional patterning. The elevations 26 produced between the depressions 24 are ~~usually~~ preferably shaped in convex fashion. In this case, one-dimensional patternings are formed by way of example with a trapezoidal (see Figure 1), triangular, circle segment or hemispherical cross-sectional form and two-dimensional patternings are correspondingly formed in the form of truncated pyramids, truncated cones, cones, sphere segments or hemispheres.

On page 15, amend the paragraph beginning on line 6 as follows:

As a further variant of the first exemplary embodiment of the semiconductor chip, a transparent, conductive layer with the lowest possible contact resistance with respect to the semiconductor may be provided on the patterned second main face 18 of the multilayer structure 12. Such a transparent, conductive layer makes it possible to compensate for the disadvantage that the patterning of the multilayer structure for increasing the efficiency of coupling out radiation at the same time reduces its transverse conductivity. An optimum current supply to all regions of the semiconductor chip is obtained without impairing the coupling-out of radiation

from the multilayer structure by metal contacts on the latter. This variant corresponds closely to the embodiment shown in Figure 4.